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EXAMINER	
CALANDRA, ANTHONY J	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/577,434	Applicant(s) BENAOUDIA ET AL.	
	Examiner ANTHONY J. CALANDRA	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 23 January 2009.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1 and 3-13 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1 and 3-13 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

Detailed Office Action

1. The communication dated 1/23/2009 has been entered and fully considered

2. Claim 2 has been canceled. Claims 1, 6, 9, and 13 have been amended. Claims 1 and 3-13 are currently pending.

Response to Arguments

Applicant submitted evidence that the disclosure of LAPERRIERE was dated 10/28/2003 (versus 10/26/2006) and therefore not available as evidence under 102(b). While an abstract, compendium book or CD may have been given out at the beginning of the conference the examiner does not have any further evidence to support a *prima facie* case that the document or summary thereof was available before the 10/28/2003 oral disclosure. Therefore the examiner has withdrawn the rejections towards LAPERRIERE. Examiner notes for the record that 102(a) public knowledge cannot be applied because of the foreign priority document.

As for the second set of rejections applicant asserts that while XIA discloses wood chip quality it does not teach 'wood chip size'. The examiner acknowledged as much in the office action and asserted that wood chip size was an important known factor in refining. XIA states that bleach plant brightness is dependent on specific energy and wood chip species/chip quality. Specific energy is a refining parameter affected by chip size, therefore chip size has an effect on bleach plant brightness

It is the examiners position that chip size is such a well known quality factor for refining that the term 'chip quality' would be instantly recognizable to the artisan of ordinary skill in the art as including 'chip size'. However, as the applicant disagrees the

examiner presents *Influence of knot fibers on TMP properties by* SAHLBERG. SAHLBERG discloses that over-thick and over-sized chips tend to contain knots [pg. 162 column 3 and pg. 163 column 2]. SAHLBERG discloses that chips with high knot content consume more peroxide and have a lower brightness [Table III]. Therefore chip size which is a surrogate for knot content is a chip quality parameter that is known by those of ordinary skill in the art to affect the bleachability of mechanical pulp.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-5, 7, 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Integrated Intelligent Control System for Peroxide Bleaching Processes* by XIA et al., hereinafter XIA, in view of *Economizing the Bleaching Agent Consumption by Controlling Wood Chip Brightness* by DING et al., hereinafter DING, and , if necessary, *Influence of knot fibers on TMP properties by* SAHLBERG, hereinafter SAHLBERG.

As for claim 1, XIA discloses wood species and chip quality as important affective variables which effect brightness [pg. 594]. XIA does not disclose specifically measuring reflectance related data of wood chips. Examiner notes that wood species has a very large effect on reflectance of wood chips (cherry wood is much darker than say balsa wood). DING discloses a system that is capable of measuring wood chip reflectance data and that said data effects brightness after bleaching [abstract, Conclusion]. At the time of the invention it would have been *prima facie* obvious for a person of ordinary skill in the art to apply a known measurement system such as taught by DING to improve the control system taught by XIA. Both XIA and DING look to control pulp brightness resultant from bleaching of mechanical pulp. The chip measurements taught by DING would have the predictable result of improving the neural network modeling of XIA as chip reflectance is shown to have a direct effect on brightness.

XIA discloses a control system which is capable of controlling multiple affecting factors such as caustic, peroxide and silicate through the use of a neural network

containing intelligent control system [abstract, pg. 594]. XIA discloses a method to control quality parameters such as brightness, freeness and bulk [594]. While XIA discloses both peroxide and chip quality as effecting factors and pulp brightness as the quality factor that is being affected it only teaches the use of the system in general. As such, XIA teaches the method steps of the instant claims but does not give the specific example of using peroxide, brightness, and wood chip quality and instead teaches more than just those factors.

XIA discloses initial information being inputted into the computer including peroxide charge [Figure 3] and discloses chip data being fed into the computer [Figure 3]. XIA discloses that the action variable and operational conditions are fed into the matrix simulator which outputs resultant variables. Brightness is shown to be controlled by chip quality and peroxide as two of many factors [Figure 3]. The computer is shown to iteratively repeat measurements [Figure 7] and data collection while monitoring for undesirable conditions and the cause of said conditions (comparing predicted values) and then deciding corrective actions (optimizing the bleaching dosage).

XIA discloses chip quality [pg. 594]. Wood chip size is a chip quality feature that is important in refining. Large chips will tend to be refined poorly and as such will require more bleaching. XIA states that bleach plant brightness is dependent on specific energy and wood chip species/chip quality. Specific energy is a refining parameter affected by chip size, therefore chip size has an effect on bleach plant brightness. It is the examiners position that chip size is such a well known quality factor for refining and that the term 'chip quality' would be instantly recognizable to the artisan of ordinary skill in the art as including ‘chip size’. However, if necessary, as the applicant disagrees, the

examiner presents SAHLBERG. SAHLBERG discloses that over-thick and over-sized chips tend to contain knots [pg. 163 column 2]. SAHLBERG discloses that chips with high knot content consume more peroxide and have a lower brightness [Table III]. Therefore chip size, which is a surrogate for knot content, is a chip quality parameter that is known by those of ordinary skill in the art to affect the bleachability of mechanical pulp. At the time of the invention it would have been obvious to a person of ordinary skill in the art to measure the chip quality parameter, chip size, as taught by SAHLBERG, to improve the control system of XIA/DING. A person of ordinary skill in the art would expect that by measuring chip size distribution as one of the chip quality parameters the brightness and required peroxide could be better calculated/controlled.

As for claim 3, DING discloses that wood chip moisture effects brightness [conclusion].

As for claim 4, XIA discloses a neural network [abstract]. XIA further discloses that experimental data (lab testing) is fed into the computer system [Figure 1]. Examiner has interpreted the lab testing as the training data for the neural network contained within. Further, XIA discloses continuous training as it shows the matrix simulator continuing to receive data back and forth from the control system [Figure 7].

As for claim 5, XIA does not explicitly state that the wood pulp is made from a refining process; however this is implicit within the reference. XIA discloses that specific energy is an important process variable (kwhr/t) which affects the pulp properties [pg. 594]. Specific energy is a unit of measure used in refining. XIA discloses that the control system is hooked up to the DCS which can control affective factors such as peroxide, caustic, and silicate charge.

As for claim 9, examiner recognizes that applicant has attempted to invoke 112 6th paragraph by using the 'means for language'. Examiner has interpreted the 'means for estimating a set of wood chip properties' as a CMS or functional equivalent. Applicant does not explicitly disclose what the 'means for comparing' or 'means for optimizing' are other than software running on a computer and as such examiner has interpreted such means as software programs/advanced control programs which include a neural network.

XIA discloses an apparatus capable of controlling a pulp bleaching system using a neural network [Figure 2 and abstract]. XIA discloses further discloses data processor means implementing a predictive model receiving at corresponding inputs thereof said wood chip properties data and an initial bleaching agent dosage value for generating predicted brightness value of pulp to produce from said wood chips, to estimate the optimal bleaching agent dosage for which said predicted brightness value substantially reaches said required brightness value [abstract, pg.1 Architecture of IOMCS, Figure 3]. It is the examiners position that the software and computer neural network of XIA includes a' means for comparing' and a 'means for optimizing' in its software module.

XIA discloses that the properties of wood species and chip quality are measured and effect final pulp quality but does not disclose how they are measured [pg. 594]. DING discloses a CMS system that is capable of measuring chip properties [abstract], the CMS can also be programmed to measure 2 dimensional chip readings [future works]. At the time of the invention it would have been *prima facie* obvious for a person of ordinary skill in the art to use the CMS system of DING with the neural network of XIA. It is obvious to apply a known measurement technique of a CMS to a known device such as the neural network of XIA. The CMS system would improve the neural network

system of XIA by being able to measure additional chip properties which effect pulp quality such as moisture and brightness. In addition to the CMS system chip size could also be determined by size classification through screening as discussed in SAHLBERG [pg. 163 column 3].

As for claim 10, XIA discloses that the apparatus includes a neural network [abstract]. Figure 1 shows lab testing (experimentally derived data) information being fed into the computer apparatus containing the neural network [figure 1, abstract], which can control pulp brightness.

As for claim 11, examiner notes that applicant has invoked 112 6th paragraph by using the 'means for language'. Examiner has interpreted the 'means for adding a bleaching agent' to be a pipe and control valve run by a control system. XIA discloses a neural network with the capability for controlling the optimum bleaching agent [abstract, Figure 7]. XIA does not explicitly disclose that the pulp being sent to bleaching has been refined; however this is implicit in the reference as it states the input parameter of specific energy, kwhr/t, which is a unit of measurement for refiner energy. The future DCS (Digital control system) connection disclosed by XIA is a means for adding bleaching agent to produce bleached pulp [Figure 7]. Control valves and pipes while not disclosed by XIA are well known in the art and used in all modern bleach plants.

4. Claims 6, 8, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Integrated Intelligent Control System for Peroxide Bleaching Processes* by XIA et al., hereinafter XIA, in view of *Economizing the Bleaching Agent Consumption by Controlling Wood Chip Brightness* by DING et al., hereinafter DING, and if necessary, *Influence of knot fibers on TMP properties by* SAHLBERG, hereinafter SAHLBERG, as

applied to claims 1, 3-5, 7, 9-10 above, and further in view of U.S. 2003/0149493 BLEVINS et al., hereinafter BLEVINS, as evidenced by *Quality Prediction by Neural Network for Pulp and Paper* Processes by KIM et al., hereinafter KIM.

As for claim 6 and 7, XIA/DING/SAHLBERG do not explicitly disclose an attenuation of estimated wood chip properties caused by a time delay. However, to have accurate modeled correlation data it is necessary to have such a delay. Without such a delay the predicted brightness would be based on the input parameters for the wrong chips since there are multiple processing steps in between chip property measurement and pulp brightness measurement including refining as disclosed by XIA/DING/SAHLBERG (i.e. no delay the predicted brightness would be based on chips that are just being tested and haven't been refined yet/bleached yet and thus give inaccurate results). As such it would have been obvious to a person of ordinary skill in the art to optimize the time of delay signal such that the measured chip quality inputs matched with when the same chips were subject to bleaching such that more accurate data/results would be obtained. Further, people of ordinary skill in the art recognize time delay as an important variable which neural networks can handle [KIM pg. 105 paragraph 2 and 3]. Alternatively, BLEVINS discloses the use of a variable time delay that can account for delays in process when using model predictive control [abstract]. It is *prima facie* obvious to apply one known technique such as time delay of BLEVINS to the known neural network predictive control system of XIA/DING/SAHLBERG. The time delay would predictably provide more accurate process control. Both BLEVINS and XIA/DING/SAHLBERG teach advanced control methods, further BLEVINS and XIA/DING/SAHLBERG deal with brightness control. With the inclusion of time-delay processing XIA would continue

to feed the error signal back into the optimization module and performing several iterations and then taking corrective action on peroxide charge with the advanced time control attenuation [Figure 7 continuous control system pg. 597 Fault reasoning technique].

As for claims 12 and 13, examiner notes that applicant has invoked 112 6th paragraph by using the ‘means for language’. Examiner has interpreted the ‘means for adding a bleaching agent’ to be a pipe and control valve run by some type of control system. Applicant does not explicitly discloses in the specification what the ‘means for estimating’, ‘means for time delaying’, ‘means for time delaying’ are other than software running on a computer and as such examiner has interpreted such means as software programs/advanced control programs.

XIA/DING/SAHLBERG do not explicitly disclose time delay means. However, it is the position of the examiner that the computer as described by XIA would be capable of adding a time delay. Further, to have accurate modeled correlation data it is necessary to have such a delay. Without such a delay the predicted brightness would be based on the input parameters for the wrong chips since there are multiple processing steps in between chip property measurement and pulp brightness measurement including refining as disclosed by XIA (i.e. no delay the predicted brightness would be based on chips that are just being tested and haven’t been refined yet and thus give inaccurate results). As such it would have been obvious to a person of ordinary skill in the art to optimize the time of delay signal such that the measured chip quality inputs matched with when the same chips were subject to bleaching such that more accurate data/results would be obtained. Further, people of ordinary skill in the art recognize time delay as an

important variable which neural networks can handle as evidenced by [KIM pg. 105 paragraph 2 and 3]. Alternatively, BLEVINS discloses the use of a variable time delay that can account for delays in process when using model predictive control [abstract]. It is *prima facie* obvious to apply one known technique such as time delay of BLEVINS to the known neural network predictive control system of XIA/DING/SAHLBERG. The time delay would predictably provide more accurate process control. BLEVINS and XIA/DING/SAHLBERG teach advanced control systems, further BLEVINS and XIA/DING/SAHLBERG deal with brightness control. With the inclusion of time-delay processing XIA would continue to feed the error signal back into the optimization module and performing several iterations and then taking corrective action on peroxide charge with the advanced time control attenuation [section 3.3 and figure 5]. XIA further discloses means for comparing, a predictive model and means for adding a bleaching agent [Figure 7].

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571) 270-5124. The examiner can normally be reached on Monday through Thursday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AJC/

/Eric Hug/
Primary Examiner, Art Unit 1791